Small Animal Science

Primary Career Cluster:	Agriculture, Food and Natural Resources
Consultant:	Steven Gass, (615) 532-2847, Steven.Gass@tn.gov
Course Code(s):	5958
Prerequisite(s):	*Agriscience* (5957)
Credit:	1
Grade Level:	10
Graduation Requirements:	This course satisfies one of three credits required for an elective focus when taken in conjunction with other Agriculture courses.
Programs of Study and Sequence:	This is the second course in the *Veterinary and Animal Sciences* program of study.
Aligned Student Organization(s):	FFA: http://www.tnffa.org Allie Ellis, (615) 253-5207, Allie.Ellis@tn.gov
Coordinating Work-Based Learning:	All Agriculture students are encouraged to participate in a Supervised Agricultural Experience (SAE) program. In addition, Teachers are encouraged to use embedded WBL activities. For information, visit http://tn.gov/education/cte/work_based_learning.shtml.
Available Student Industry Certifications:	None
Dual Credit or Dual Enrollment Opportunities:	There are no statewide dual credit/dual enrollment opportunities for this course. If interested in establishing a local opportunity, reach out to a local postsecondary institution.
Teacher Endorsement(s):	048, 150, 448
Required Teacher Certifications/Training:	None
Teacher Resources:	http://www.tn.gov/education/cte/AgricultureFoodNaturalResources.shtml

Course Description

Small Animal Science is an intermediate course in animal science and care for students interested in learning more about becoming a veterinarian, vet tech, vet assistant, or pursuing a variety of scientific, health, or agriculture professions. This course covers anatomy and physiological systems of different groups of small animals, as well as careers, leadership, and history of the industry. Upon completion of this course, proficient students will be prepared for more advanced coursework in veterinary and animal science. Standards in this course are aligned with Tennessee State Standards for English Language Arts & Literacy in Technical Subjects, Tennessee State Standards in Mathematics, Tennessee state standards in Biology I, Biology II, and Anatomy and Physiology, as well as National Agriculture, Food and Natural Resources Career Cluster Content Standards.*

Approved April 10, 2015

Program of Study Application

This is the second course in the *Veterinary and Animal Sciences* programs of study. For more information on the benefits and requirements of implementing this program in full, visit the Agriculture, Food, and Natural Resources website at:
http://www.tn.gov/education/cte/AgricultureFoodNaturalResources.shtml.

Course Standards

History of Domestication

1) Synthesize research on the history of small animal domestication to produce an informative essay, including defining and applying industry-specific terminology to classify animals in the correct taxonomy. Justify the historical uses and roles of domesticated animals, and compare historical processes of small animal domestication. (TN Reading 1, 2, 4; TN Writing 2, 4, 9)

Economic, Occupational, and Technological Implications

2) Determine the general economic impact of the small animal industry by investigating both home and business implications of small animal domestication through governmental and news publications. (TN Reading 1; TN Writing 7)

3) Explore and compare local and regional career opportunities in the small animal industry. Describe in a written or visual representation the knowledge, skills, and abilities necessary for a diverse range of careers in small animal sciences, citing specific textual evidence from local job postings and Tennessee labor data. (TN Reading 1; TN Writing 2, 9)

4) Examine specific technologies that have evolved within the small animal industry (such as, but not limited to, equipment, procedures, and healthcare) and evaluate the economic and societal implications of each. (TN Reading 1, 2, 4)

Personal and Occupational Health and Safety

5) Identify, research, and determine the significance of zoonotic diseases associated with small animals. Compare and contrast findings from multiple sources relating to a specific disease (including student's own experience, laboratory experiment, case studies, and scholarly journals). Justify the use of different methods of infection control in the prevention or management of a zoonotic disease and evaluate the efficacy of existing small animal biosecurity measures. (TN Reading 1, 5, 9)

6) Correctly identify and summarize laws and regulations that pertain to small animal health and safety in an explanatory text, citing specific textual evidence from state and national legislation. Describe health requirements and necessary documentation for small animal transportation and change of ownership. (TN Reading 1, 9; TN Writing 2, 4)

7) Review common laboratory safety procedures for tool and equipment operation in the small animal science laboratories, including but not limited to accident prevention and control

procedures. Demonstrate the ability to follow safety and operational procedures in a lab setting and complete a safety test with 100 percent accuracy. (TN Reading 3)

8) Demonstrate in a live setting or in a presentation the ability to follow procedures precisely, attending to special cases or exceptions noted in appropriate materials, and apply them to the following areas:
    a. Animal restraint and handling
    b. Techniques for transportation
    c. Appropriate use of chemicals (such as pesticide, fungicide, disinfectants)
    Differentiate between effective methods for handling small animals and methods proven to be less effective. (TN Reading 3)

Responsible Pet Ownership

9) Research and prepare informational resources for potential pet owners (such as fact sheets, brochures, posters, or presentations) that present the benefits and responsibilities of pet ownership, including listing important factors to consider when choosing a pet, comparing and contrasting available sources for obtaining a pet, identifying and summarizing common laws governing pet ownership, and investigating the societal and economic issues that may impact pet owners. (TN Reading 1, 7, 9; TN Writing 4, 6, 8, 9)

10) Drawing from multiple sources on small animal management practices, craft an argumentative essay that contrasts the characteristics of responsible pet ownership with ownership practices that have been shown to be negligent or inappropriate. Using supporting evidence from the research to develop claim(s) and counterclaim(s), argue why certain practices fail and others succeed. Topics may include:
    a. Training and behavior management
    b. Housing, boarding, and transporting
    c. Breeding
    d. Feeding and nurturing
    e. Management of health conditions
    f. Matching of animal type/breed and owner lifestyle (including living conditions, geographic location, and number and age of family members)
    (TN Reading 1, 9; TN Writing 1, 4, 8, 9)

Animal Ethics

11) Identify the fundamental philosophies related to animal rights and animal welfare. Compare the impact of specific persons, organizations, and legislation related to animal rights and welfare of small animals, citing specific textual evidence. (TN Reading 1, 9; TN Writing 9)

12) Investigate current small animal issues by analyzing an author's purpose and assessing the extent to which the reasoning and evidence in a specific text support the author's claim. Debate specific issues by forming and supporting claims and counterclaims with specific data and evidence. Issues related to animal rights and animal welfare may include, but are not limited to:
    a. Abuse and/or neglect
    b. Illegal capture and/or trade
    c. Overpopulation

      d.   Control of populations
      e.   Euthanasia
      f.   Exhibiting and showing
      g.   Global issues in small animal ethics and their relation to local problems.
(TN Reading 6, 7, 8, TN Writing 1, 9)

Nutrition and Digestive Systems

13) Create a visual representation to differentiate between ruminant and non-ruminant animals, comparing and contrasting their anatomical and physiological differences. (TN Reading 7, TN A&P 5)

14) Using information from scholarly journals or Tennessee Extension Service, research nutrient requirements of the diets of small animals and organize these into various nutrient groups. Interpret feed labeling and evaluate factors such as life stage and activity level to determine the nutritional needs and then recommend balance rations for small animals, justifying recommendations with evidence from the text. (TN Reading 1, 7; TN Writing 2, 4; TN A&P 6)

15) Distinguish among the symptoms of nutritional diseases relevant to small animals and recommend the appropriate control procedures, expressed in writing. (TN Reading 7, 9; TN Writing 2)

Genetics and Reproduction

16) Research and develop illustrative models of the major components of male and female reproductive systems in small animals and prepare a short narrative to distinguish the function of reproductive organs, endocrine glands, and hormones. Produce an explanatory essay summarizing the physiological changes that occur during reproductive phases, including the estrus cycle, fertilization, gestation, parturition and lactation. (TN Reading 7; TN Writing 2, 4; TN A&P 6)

17) Using graphic representations and descriptive text, explain how the fundamental principles of genetics, such as but not limited to concepts of inheritance and gene transfer, apply to the study of small animals. (TN Biology I 4, TN Biology II 4)

Fundamental Care and Health of Dogs and Cats

18) Synthesize research on the historical importance of dogs and cats, noting major economic, social, and medical advances impacting domestication. Produce an informational essay or model (such as a timeline, graphical illustration, or presentation) that differentiates between the defining characteristics of common dog and common cat breeds. Demonstrate conceptual understanding and technical skill in current practices of comprehensive health care and management for the following:
      a.   Precisely follow effective grooming procedures and techniques to maintain healthy skin, coat, nails, eyes, and ears
      b.   Design appropriate facilities based on assessment of needs and present plans in a visual format

     c. Identify appropriate owner/handler responses to behaviors and instincts to ensure safety of both individual and small animal in a variety of situations

     d. Distinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence

     e. Using quantitative reasoning and appropriate units, calculate rations based on animal characteristics (age, weight, breed, activity level) and nutritional needs

     f. Illustrate the reproductive cycle graphically, and summarize available breeding methods and current reproductive technologies

     g. Research common diseases and parasites and their effects on the health of dogs and cats, and draw evidence from relevant medical literature to recommend the best prevention or control measures.

(TN Reading 1, 2, 3, 7, 8, 9; TN Writing 2, 7, 8, 9; TN Math N-Q)

Fundamental Care and Health of Rabbits, Guinea Pigs, Chinchillas, and Rodents

19) Synthesize research on the historical importance of rabbits, guinea pigs, chinchillas, and rodents, noting major economic, social, and medical advances impacting domestication. Produce an informational essay or model (such as a timeline, graphical illustration, or presentation) that differentiates between their defining characteristics. Demonstrate conceptual understanding and technical skill in current practices of comprehensive health care and management for the following:

     a. Precisely follow effective grooming procedures and techniques to maintain healthy skin, coat, nails, eyes, and ears

     b. Design appropriate facilities based on assessment of needs and present plans in a visual format

     c. Identify appropriate owner/handler responses to behaviors and instincts to ensure safety of both individual and small animal in a variety of situations

     d. Distinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence

     e. Using quantitative reasoning and appropriate units, calculate rations based on animal characteristics (age, weight, breed, activity level) and nutritional needs

     f. Illustrate the reproductive cycle graphically, and summarize available breeding methods and current reproductive technologies

     g. Research common diseases and parasites and their effects on the health of rabbits, guinea pigs, chinchillas, and rodents, and draw evidence from the most recent medical literature to recommend the best prevention or control measures.

(TN Reading 1, 2, 3, 7, 8, 9; TN Writing 2, 7, 8, 9; TN Math N-Q)

Fundamental Care and Health of Avians, Fish, Amphibians, and Reptiles

20) Synthesize research on the historical importance of avians, fish, amphibians, and reptiles, noting major economic, social, and medical advances impacting domestication. Produce an informational essay or model (such as a timeline, graphical illustration, or presentation) that differentiates between their defining characteristics. Demonstrate conceptual understanding and technical skill in current practices of comprehensive health care and management for the following:

     a. Precisely follow effective grooming procedures and techniques for applicable species

b. Design appropriate facilities based on assessment of needs and present plans in a visual format
c. Identify appropriate owner/handler responses to behaviors and instincts to ensure safety of both individual and small animal in a variety of situations
d. Distinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence
e. Using quantitative reasoning and appropriate units, calculate rations based on animal characteristics (age, weight, breed, activity level) and nutritional needs.
f. Illustrate the reproductive cycle graphically, and summarize available breeding methods and current reproductive technologies
g. Research common diseases and parasites and their effects on the health of birds, fish, amphibians, and reptiles, and draw evidence from the most recent medical literature to recommend the best prevention or control measures.

(TN Reading 1, 2, 3, 7, 8, 9; TN Writing 2, 7, 8, 9; TN Math N-Q)

Standards Alignment Notes

*References to other standards include:
- TN Reading: Tennessee State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects; Reading Standards for Literacy in Science and Technical Subjects 6-12; Grades 9-10 Students (page 62).
  - Note: While not directly aligned to one specific standard, students who are engaging in activities outlined above should be able to also demonstrate fluency in Standard 10 at the conclusion of the course.
- TN Writing: Tennessee State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects; Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6-12; Grades 9-10 Students (pages 64-66).
  - Note: While not directly aligned to one specific standard, students who are engaging in activities outlined above should be able to also demonstrate fluency in Standards 3, 5, and 10 at the conclusion of the course.
- TN Math: Tennessee State Standards for Mathematics; Math Standards for High School: Number and Quantity (pages 58-83).
  - Note: The standards in this course are not meant to teach mathematical concepts. However, the concepts referenced above may provide teachers with opportunities to collaborate with mathematics educators to design project based activities or collaborate on lesson planning. Students who are engaging in activities listed above should be able to demonstrate quantitative reasoning as applied to specific technical concepts. In addition, students will have the opportunity to practice the habits of mind as described in the eight Standards for Mathematical Practice.
- SAE: Supervised Agricultural Experience: All Agriculture students are encouraged to participate in a Supervised Agricultural Experience program to practice and demonstrate the knowledge and skills learned in their agriculture courses.
- TN Biology I: Tennessee Science: Biology I, standard 4.
- TN Biology II: Tennessee Science: Biology II, standard 4
- TN A&P: Tennessee Science: Anatomy and Physiology, standards 5 and 6.

- AFNR: National Agriculture, Food and Natural Resources (AFNR) Career Cluster Content Standards: Students engaged in activities outlined above should be able to demonstrate fluency in Standards AS at the conclusion of the course.
- P21: Partnership for 21st Century Skills Framework for 21st Century Learning
  - o Note: While not all standards are specifically aligned, teachers will find the framework helpful for setting expectations for student behavior in their classroom and practicing specific career readiness skills.